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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 10/757,413
Filing Date: January 15, 2004
Appellant(s): AKIYAMA ET AL.

Mr. David W. Hill
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed February 17, 2009 appealing from the Office action mailed June 18, 2008.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The Appellants' statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The Appellants' statement of the grounds of rejection to be reviewed on appeal is correct.

GROUND OF REJECTION NOT ON REVIEW

The following grounds of rejection have not been withdrawn by the examiner, but they are not under review on appeal because they have not been presented for review in the Appellants' brief. Dependent claims 4 and 10 stand or fall with independent claims 1 and 7, respectively.

Claims 4 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over either [Moriwaki (Japanese Publication 7-205244) in view of Sekido (Japanese Publication 7-290548)] or Morikawa (Japanese Publication 62-187009) as applied to claims 1, 3, 5-7, 9 and 11-14 above, and further in view of Neko et al. (European Patent Application 418398).

Claims 4 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over either [Moriwaki (Japanese Publication 7-205244) or Morikawa (Japanese Publication 62-187009)] taken together with Inden et al. (Pat. No. 4,905,165) in view of Colorblind Barrier Free as applied to claims 1, 3, 5-7, 9 and 11-14 above, and further in view of Neko et al. (European Patent Application 418398).

Neko (col. 7, lines 21-31) discloses the determinant stopping (terminating) an injecting operation of the injection molding device when the measured value waveform in which the pressure data exceeds a reference pressure waveform by a predetermined range is continuously detected more than a predetermined times. It would have been obvious to a person of ordinary skill in the art to stop the operation of the injection molding device in either JP'244 or JP'009 in view of the teaching of Neko since the repeated exceeding measurement would indicate that the process needs correction.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

JP 07-290548	Sekido et al.	11-1995
JP 62-187009	Morikawa	8-1987
EP 418398	Neko et al.	10-1990
4,905,165	Inden et al.	2-1990
JP 2001-287254	Moriwaki	10-2001

Colorblind Barrier Free, Okabe et al., "How to make figures and presentations that are friendly to color blind people", retrieved from the internet URL:<http://jfly.iam.u-tokyo.ac.jp/color/> on Nov. 27, 2007, last updated (Nov. 20, 2002), pp. 1-19.

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Ground A: Claims 1, 3, 5-7, 9 and 11-14 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Moriwaki (Japanese Publication 7-205244) in view of Sekido (Japanese Publication 7-290548).

Moriwaki (Japanese Publication 7-205244) discloses an injection molding device for ejecting a molding material, measuring the injecting pressure, forming an upper and lower limit waveform based on a reference waveform. The processor decides whether the measured result waveform is between the upper and lower limit waveforms or not, determines whether the product is defective, and outputs a malfunction signal. JP'244 does not specify that the injection pressure is from a hydraulic cylinder. The use of hydraulic cylinders to inject material into a mold cavity and the measuring of the pressure of the hydraulic cylinder is conventional in the art of injection molding and would have been used in JP'244, see applicant's disclosure page 1 and 2. Applicant's

disclosure states "on the related waveform monitoring apparatus described in JP-a-7-205244, a reference waveform is not shown when non-conformity is determined so that a nonconforming section and the degree of nonconformity as well as the difference and variation from a conformity case are not clear." Sekido JP'548 clearly shows the displaying of the measured injection pressure waveform compared to the upper and lower limit values. It would have been obvious to a person of ordinary skill in the art to show the measured pressure waveform in the display of JP'244 since the pressure is measured and the values are compared in JP'244.

Additionally, as to the marking on the display, the examiner believes that the marking relates to the content of information being displayed rather than any functionality or methodology involved in causing the display itself, features best described as "non-functional descriptive material". Such descriptive material should not be given patentable weight absent a new and unobvious functional relationship between the descriptive material and the substrate (i.e. display). See *In re Lowry*, 32 F.3d 1579, 1583-84, 32 USPQ2d 1031, 1035 (Fed. Cir. 1994); *In re Ngai*, 367 F.3d 1336, 1338, 70 USPQ 1862, 1864 (Fed. Cir. 2004). Therefore, the meaning attributed to the information displayed cannot be used to distinguish the claimed information displayed from prior art displays.

Ground B: Claims 1, 3, 5-7, 9 and 11-14 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Morikawa (Japanese Publication 62-187009).

Morikawa JP'009 discloses a hydraulic cylinder and a sensor for measuring the pressure for ejecting a molding material. The measured value is compared with upper

and lower limits and if the value is outside the range an alarm is issued, see Figures 1-3 and abstract.

Additionally, as to the marking on the display, the examiner believes that the marking relates to the content of information being displayed rather than any functionality or methodology involved in causing the display itself, features best described as "non-functional descriptive material". Such descriptive material should not be given patentable weight absent a new and unobvious functional relationship between the descriptive material and the substrate (i.e. display). See *In re Lowry*, 32 F.3d 1579, 1583-84, 32 USPQ2d 1031, 1035 (Fed. Cir. 1994); *In re Ngai*, 367 F.3d 1336, 1338, 70 USPQ 1862, 1864 (Fed. Cir. 2004). Therefore, the meaning attributed to the information displayed cannot be used to distinguish the claimed information displayed from prior art displays.

Ground C: Claims 1, 3-7 and 9-14 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Neko et al. (European Patent Application 418398).

Neko discloses a waveform monitoring apparatus including a hydraulic cylinder (col. 12, line 14), incorporated in an injection molding device for ejecting a molding material into a mold. A sensor (col. 12, lines 16-19) generates pressure data of the hydraulic cylinder. A determinant (col. 10, line 51- col. 11, line 10 and col. 13, lines 40-44), forms a measured value waveform based on the pressure data, and determines whether the pressure data exceeds a reference pressure waveform by a predetermined range. A marking applier (col. 11, lines 11-39) applies a marking (value ER) to an excess portion of the measured value waveform determined by the determinant. A

sorter (col. 11, line 55-col. 12, line 2) sorts a product formed from the molding material, wherein the determinant outputs a determination signal indicating whether the pressure data exceeds the reference pressure waveform by the predetermined range to the sorter. Neko (col. 7, lines 21-31) discloses the determinant stopping (terminating) an injecting operation of the injection molding device when the measured value waveform in which the pressure data exceeds a reference pressure waveform by a predetermined range is continuously detected more than a predetermined times. In Neko (col. 5, lines 24-44), the determinant sets an upper limit range and a lower limit range with respect to the reference pressure waveform as the predetermined range. A storage (RAM 108) stores the measured value waveform to which the marking is applied.

Additionally, as to the marking on the display, the examiner believes that the marking relates to the content of information being displayed rather than any functionality or methodology involved in causing the display itself, features best described as "non-functional descriptive material". Such descriptive material should not be given patentable weight absent a new and unobvious functional relationship between the descriptive material and the substrate (i.e. display). See *In re Lowry*, 32 F.3d 1579, 1583-84, 32 USPQ2d 1031, 1035 (Fed. Cir. 1994); *In re Ngai*, 367 F.3d 1336, 1338, 70 USPQ 1862, 1864 (Fed. Cir. 2004). Therefore, the meaning attributed to the information displayed cannot be used to distinguish the claimed information displayed from prior art displays.

Ground D: Claims 1, 3-7 and 9-14 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Moriwaki (Japanese Publication 2001-287254) taken together with Neko et al. (European Patent Application 418398).

Moriwaki JP'254 discloses a method and apparatus for monitoring a waveform, including generating pressure data of an injection molding device for ejecting a molding material into a mold and forming a measured value waveform (Fig. 4) based on the pressure data. Moriwaki JP'254 determines that the pressure data exceeds a reference pressure waveform by a predetermined range (abstract "control unit discriminates whether there is an abnormal value with respect to various waveform data". Then, a marking (outlying observation) is applied to an excess portion of the measured value waveform and displayed on the display including variances (paragraphs [0008]-[0013]. Neko (col. 12, lines 11-15) teaches that the pressure data of an injection molding device can be from either an electrically operated injector or a hydraulically operated injector. It would have been obvious to a person of ordinary skill in the art to use the data collection, storing and monitoring of Moriwaki JP'254 in a hydraulically operated injection molding apparatus since the controlling and monitoring or abnormalities of the injection pressure is similarly necessary in screw controls for electro-mechanical injection units and hydraulic injection units.

The step of outputting a determination signal to a sorter which sorts a product formed from the molding material, wherein the determination signal indicates that whether the pressure data exceeds the reference pressure waveform by the predetermined range is taught by Neko (col. 11, line 55-col. 12, line 2). It would have

been obvious to sort a product in Moriwaki JP'254 indicated by the abnormality in the waveform since the product has been determined to be abnormal in Moriwaki and thus would not have the same quality as the products produced without abnormal signals. Neko (col. 7, lines 21-31) discloses the determinant stopping (terminating) an injecting operation of the injection molding device when the measured value waveform in which the pressure data exceeds a reference pressure waveform by a predetermined range is continuously detected more than a predetermined times. It would have been obvious to a person of ordinary skill in the art to stop the injecting operation when the measured pressure data waveform exceeds a reference pressure waveform maximum and minimum detected more than a predetermined number of times in Moriwaki JP'254 since this is a clear indication that correction of the problem is not occurring during the operation of the injection molding.

Additionally, as to the marking on the display, the examiner believes that the marking relates to the content of information being displayed rather than any functionality or methodology involved in causing the display itself, features best described as "non-functional descriptive material". Such descriptive material should not be given patentable weight absent a new and unobvious functional relationship between the descriptive material and the substrate (i.e. display). See *In re Lowry*, 32 F.3d 1579, 1583-84, 32 USPQ2d 1031, 1035 (Fed. Cir. 1994); *In re Ngai*, 367 F.3d 1336, 1338, 70 USPQ 1862, 1864 (Fed. Cir. 2004). Therefore, the meaning attributed to the information displayed cannot be used to distinguish the claimed information displayed from prior art displays.

Ground E: Claims 1, 3, 5-7, 9 and 11-14 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Moriwaki (Japanese Publication 7-205244) in view of Sekido (Japanese Publication 7-290548) taken together with Inden et al. (Pat. No. 4,905,165) in view of Colorblind Barrier Free.

Moriwaki (Japanese Publication 7-205244) discloses an injection molding device for ejecting a molding material, measuring the injecting pressure, forming an upper and lower limit waveform based on a reference waveform. The processor decides whether the measured result waveform is between the upper and lower limit waveforms or not, determines whether the product is defective, and outputs a malfunction signal. JP'244 does not specify that the injection pressure is from a hydraulic cylinder. The use of hydraulic cylinders to inject material into a mold cavity and the measuring of the pressure of the hydraulic cylinder is conventional in the art of injection molding and would have been used in JP'244, see applicant's disclosure page 1 and 2. Applicant's disclosure states "on the related waveform monitoring apparatus described in JP-a-7-205244, a reference waveform is not shown when non-conformity is determined so that a nonconforming section and the degree of nonconformity as well as the difference and variation from a conformity case are not clear." Sekido JP'548 clearly shows the displaying of the measured injection pressure waveform compared to the upper and lower limit values. It would have been obvious to a person of ordinary skill in the art to show the measured pressure waveform in the display of JP'244 since the pressure is measured and the values are compared in JP'244.

Inden et al. (Pat. No. 4,905,165) discloses the use of an abnormal condition display which displays a red line, a change in color of the trend format or a change in line into a dotted line when the measured value is outside the upper or lower value (col. 4, line 65 thru col. 5, line 43). Colorblind Barrier Free (page 13) teaches using lines of different shapes and thickness so as to accommodate people that are colored blind. It would have been obvious to a person of ordinary skill in the art to use a thicker marking for the portion of the measured value outside of the high and low limits in Inden so that a person who is colored blind can distinguish the change easily.

In view of the teaching of Inden, it would have been obvious to a person of ordinary skill in the art to provide a display indicating the measured pressure value in comparison with the upper and lower limits in JP'244 wherein the measured value outside of the upper and lower limit is marked by a change in the line color or shape. The use of such a display in JP'244 would have been within the skill in the art of injection molding since the injection pressure signals are known to be an indication of the product quality.

Ground E: Claims 1, 3, 5-7, 9 and 11-14 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Morikawa (Japanese Publication 62-187009) taken together with Inden et al. (Pat. No. 4,905,165) in view of Colorblind Barrier Free.

Morikawa JP'009 discloses a hydraulic cylinder and a sensor for measuring the pressure for ejecting a molding material. The measured value is compared with upper and lower limits and if the value is outside the range an alarm is issued, see Figures 1-3 and abstract.

Inden et al. (Pat. No. 4,905,165) discloses the use of an abnormal condition display which displays a red line, a change in color of the trend format or a change in line into a dotted line when the measured value is outside the upper or lower value (col. 4, line 65 thru col. 5, line 43). Colorblind Barrier Free (page 13) teaches using lines of different shapes and thickness so as to accommodate people that are colored blind. It would have been obvious to a person of ordinary skill in the art to use a thicker marking for the portion of the measured value outside of the high and low limits in Inden so that a person who is colored blind can distinguish the change easily.

In view of the teaching of Inden, it would have been obvious to a person of ordinary skill in the art to provide a display indicating the measured pressure value in comparison with the upper and lower limits in JP'009 wherein the measured value outside of the upper and lower limit is marked by a change in the line color or shape. The use of such a display in JP'009 would have been within the skill in the art of injection molding since the injection pressure signals are known to be an indication of the product quality.

Ground G: Claims 1, 3-7 and 9-14 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Neko et al. (European Patent Application 418398) taken together with Inden et al. (Pat. No. 4,905,165) in view of Colorblind Barrier Free.

Neko discloses a waveform monitoring apparatus including a hydraulic cylinder (col. 12, line 14), incorporated in an injection molding device for ejecting a molding material into a mold. A sensor (col. 12, lines 16-19) generates pressure data of the hydraulic cylinder. A determinant (col. 10, line 51- col. 11, line 10 and col. 13, lines 40-

44), forms a measured value waveform based on the pressure data, and determines whether the pressure data exceeds a reference pressure waveform by a predetermined range. A marking applier (col. 11, lines 11-39) applies a marking (value ER) to an excess portion of the measured value waveform determined by the determinant. A sorter (col. 11, line 55-col. 12, line 2) sorts a product formed from the molding material, wherein the determinant outputs a determination signal indicating whether the pressure data exceeds the reference pressure waveform by the predetermined range to the sorter. Neko (col. 7, lines 21-31) discloses the determinant stopping (terminating) an injecting operation of the injection molding device when the measured value waveform in which the pressure data exceeds a reference pressure waveform by a predetermined range is continuously detected more than a predetermined times. In Neko (col. 5, lines 24-44), the determinant sets an upper limit range and a lower limit range with respect to the reference pressure waveform as the predetermined range. A storage (RAM 108) stores the measured value waveform to which the marking is applied.

Inden et al. (Pat. No. 4,905,165) discloses the use of an abnormal condition display which displays a red line, a change in color of the trend format or a change in line into a dotted line when the measured value is outside the upper or lower value (col. 4, line 65 thru col. 5, line 43). Colorblind Barrier Free (page 13) teaches using lines of different shapes and thickness so as to accommodate people that are colored blind. It would have been obvious to a person of ordinary skill in the art to use a thicker marking for the portion of the measured value outside of the high and low limits in Inden so that a person who is colored blind can distinguish the change easily.

In view of the teaching of Inden, it would have been obvious to a person of ordinary skill in the art to provide a display indicating the measured pressure value in comparison with the upper and lower limits in Neko wherein the measured value outside of the upper and lower limit is marked by a change in the line color or shape. The use of such a display in Neko would have been within the skill in the art of injection molding since the injection pressure signals are known to be an indication of the product quality.

Ground H: Claims 1, 3-7 and 9-14 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Moriwaki (Japanese Publication 2001-287254) taken together with Neko et al. (European Patent Application 418398) in view of Inden et al. (Pat. No. 4,905,165) and Colorblind Barrier Free.

Moriwaki JP'254 discloses a method and apparatus for monitoring a waveform, including generating pressure data of an injection molding device for ejecting a molding material into a mold and forming a measured value waveform (Fig. 4) based on the pressure data. Moriwaki JP'254 determines that the pressure data exceeds a reference pressure waveform by a predetermined range (abstract "control unit discriminates whether there is an abnormal value with respect to various waveform data". Then, a marking (outlying observation) is applied to an excess portion of the measured value waveform and displayed on the display including variances (paragraphs [0008]-[0013]. Neko (col. 12, lines 11-15) teaches that the pressure data of an injection molding device can be from either an electrically operated injector or a hydraulically operated injector. It would have been obvious to a person of ordinary skill in the art to use the data collection, storing and monitoring of Moriwaki JP'254 in a hydraulically operated

injection molding apparatus since the controlling and monitoring of abnormalities of the injection pressure is similarly necessary in screw controls for electro-mechanical injection units and hydraulic injection units.

The step of outputting a determination signal to a sorter which sorts a product formed from the molding material, wherein the determination signal indicates that whether the pressure data exceeds the reference pressure waveform by the predetermined range is taught by Neko (col. 11, line 55-col. 12, line 2). It would have been obvious to sort a product in Moriwaki JP'254 indicated by the abnormality in the waveform since the product has been determined to be abnormal in Moriwaki and thus would not have the same quality as the products produced without abnormal signals. Neko (col. 7, lines 21-31) discloses the determinant stopping (terminating) an injecting operation of the injection molding device when the measured value waveform in which the pressure data exceeds a reference pressure waveform by a predetermined range is continuously detected more than a predetermined times. It would have been obvious to a person of ordinary skill in the art to stop the injecting operation when the measured pressure data waveform exceeds a reference pressure waveform maximum and minimum detected more than a predetermined number of times in Moriwaki JP'254 since this is a clear indication that correction of the problem is not occurring during the operation of the injection molding.

Inden et al. (Pat. No. 4,905,165) discloses the use of an abnormal condition display which displays a red line, a change in color of the trend format or a change in line into a dotted line when the measured value is outside the upper or lower value (col.

4, line 65 thru col. 5, line 43). Colorblind Barrier Free (page 13) teaches using lines of different shapes and thickness so as to accommodate people that are colored blind. It would have been obvious to a person of ordinary skill in the art to use a thicker marking for the portion of the measured value outside of the high and low limits in Inden so that a person who is colored blind can distinguish the change easily.

In view of the teaching of Inden, it would have been obvious to a person of ordinary skill in the art to provide a display indicating the measured pressure value in comparison with the upper and lower limits in Moriwaki JP'254 wherein the measured value outside of the upper and lower limit is marked by a change in the line color or shape. The use of such a display in JP'009 would have been within the skill in the art of injection molding since the injection pressure signals are known to be an indication of the product quality.

(10) Response to Argument

Appellants have separately argued the independent apparatus claim 1 and independent method claim 7. The examiner notes that claim 12 is a method claim which clearly should be dependent from method claim 7. Claim 6 is a dependent apparatus claim corresponding in subject matter to the dependent method claim 12. As the dependent claims are not separately argued, the patentability of dependent method claim 12 should rise and fall with method claim 7.

Ground A: Rejection over Moriwaki '244 in view of Sekido

1. Apparatus claim 1 and dependent claims 3, 5, 6 and 13

(a) The Marking Applier

Appellants argue that Moriwaki '244 does not teach a marking applier and that the output of a malfunction signal in Moriwaki '244 does not teach a marking applier. Appellants' apparatus which is considered the marking applier is the process section 13 which calculates the waveform and deviation, and the display 14 converts the waveform measured values to the display, page 9, line 3 thru page 10, line 10 of the specification. The examiner contends that the waveform generator and malfunction signal would have been considered a marking applier since the signal is determined from the calculated waveform and would have signaled a portion of the result waveform being in excess of the predetermined range of the reference pressure waveform. However, in Moriwaki '244, this marking is not taught as being a thicker portion of the waveform.

Appellants argue that Sekido does not teach the marking applier. Sekido (Figs. 1a, 1b, 1c) clearly shows the displaying of the measured injection pressure waveform compared to the upper and lower limit values. The showing of the result (measured) waveform in the display of Moriwaki '244 would have been obvious since this result waveform being inserted between the upper limit waveform and the lower limit waveform is determined by the processor of Moriwaki '244. The marking applier which applies a marking to an excess portion of the measured value waveform determined by the determinant would have included a device which marks the excess portion by drawing the line of the result (measured) waveform displayed with the upper and lower limit waveforms as is shown in Fig. 1a, 1b, 1c of Sekido. The line of this result waveform line outside of the limit waveform is a marking.

Appellants' structure corresponding to the marking applier is within the process section 13 (specification page 9, lines 10-16). This same process section is the arithmetic unit which determines that the measured value data is outside of the upper and lower limits (specification page 9, lines 3-9). Both Moriwaki '244 and Sekido disclose determining whether the measured value waveform is outside of the upper and lower limits and therefor, a corresponding processing unit. The processing unit of Sekido which sends signals to the display to show the waveforms as shown in Figs. 1a, 1b, 1c of Sekido teaches a marking applier since the signals are sent to a display.

(b) The Thicker Marking

Appellants argue the thicker marking does not actually constitute printed matter under current law since printed matter includes a rather narrow class of indicia conventionally printed on a substrate. However, the display of a broadcast sporting event was considered nonfunctional descriptive material in *Ex Parte Mathias* 84 USPQ2d 1276, 1279. The prior art teaches the displaying of the measured waveform and its relationship with the upper and lower limit waveforms. The prior art teaches the error indication when the measured pressure waveform is outside the limit values. The marking on the displayed waveform being a thicker line only has meaning to the observation of the display and not to the operation of the injection molding device. Thus, the thicker marking is a "non-functional" descriptive material.

Appellants argue that the thicker marking is functionally related to the waveform monitoring apparatus because there is a correspondence between each point along the thicker marking and each corresponding point along the waveform measured by the

waveform monitoring apparatus. However, this correspondence is clearly recognized by the prior art since the relationship is used to determine the quality of the product and the operation of the injection molding machine. Additionally, Appellants argue that the thicker marking is functionally related to the waveform monitoring apparatus because the marking only appears in the excess portion determined by the determinant, so that the marking exploits both the waveshaped nature of the measured value waveform and the determinant's determinations pertaining to its location along the measured value waveform. The examiner contends that a person viewing the waveform display would be able to determine that the line is outside of the limits with or without the portion having a thicker marking and thus the function of the line has not changed. As to an apparatus that may generate a waveform and provide indications on the display, this apparatus is broadly disclosed as the process section 13 in the specification wherein no new apparatus is disclosed to perform the functional relationship between the waveform and the "marking".

Appellants argue that the thicker marking is functionally related to the waveform monitoring apparatus because it provides information about the properties of the waveform measured. However, Appellants' specification on page 14, lines 6-12 recognizes that the measured waveform may be displayed in a different color, or may be a warning lamp or buzzer. The prior art recognizes the relationship of the measured waveform and the upper and lower limits, and its use to determine the quality and operation of the injection molding machine.

(c) The Display

Appellants argue that the display waveforms of Moriwaki and Sekido do not display the measured value waveform having the excess portion to which the marking is applied. Sekido JP'548 clearly shows the displaying of the measured injection pressure waveform compared to the upper and lower limit values. The excess portion is shown beyond the upper and lower limit values in Sekido, but this excess portion is not shown as a thicker marking. The waveform line being thicker in the excess portion only relates to the appearance of the display and does not change the function of the injection molding machine or the monitoring of the pressure.

Ground A: Rejection over Moriwaki '244 in view of Sekido

2. Method claim 7 and dependent claims 9-12 and 14

(a) Applying The Marking

Appellants argue that neither Moriwaki'244 nor Sekido do not teach applying a marking to an excess portion of the measure value waveform and that the Examiner has not explained why this would have been obvious. However, Moriwaki'244 describes a malfunction signal being output which is clearly similar to the marking being a warning lamp or buzzer (Appellants' specification page 14, lines 11 and 12). Additionally, Sekido JP'548 clearly shows the displaying of the measured injection pressure waveform compared to the upper and lower limit values. These waveforms with a portion of the line outside the upper and lower limit values are markings, but the portion is not a thicker line. The waveform outlying the limit values is marking the excess portion of the measured value waveform.

(b) Applying a Thicker Marking

Appellants argue that the thicker marking does not actually constitute printed matter under current case law. The examiner contends that the marking being thicker than other portion of the measured value waveform would have been considered printed matter since the prior art teaches the waveform line shown outside of the upper and lower limits which would provide the same function of indicating product defects.

Appellants argue that the thicker marking is entitled to patentable weight because there exists a new and unobvious functional relationship between the thicker marking and the waveform monitoring apparatus and its component. The functional relationship between the thicker marking and the waveform monitor does not change the function of the injection molding machine, only the appearance of the line in the display.

(c) Displaying the Excess Portion with the Marking

Appellants argue that the display waveforms of Moriwaki and Sekido do not display the measured value waveform having the excess portion to which the marking is applied. Sekido JP'548 clearly shows the displaying of the measured injection pressure waveform compared to the upper and lower limit values. The excess portion is shown beyond the upper and lower limit values in Sekido, but this excess portion is not shown as a thicker marking. The waveform line being thicker in the excess portion only relates to the appearance of the display and does not change the function of the injection molding machine or the monitoring of the pressure.

Ground B: Rejection over Morikawa '009

1. Apparatus claim 1 and dependent claims 3, 5, 6 and 13

(a) The Marking Applier

Appellants argue that the alarm in Morikawa does not teach or suggest a marking applier. Morikawa provides a CRT 33 shown in Fig. 1. Figures 2 and 3 show the monitored (sampled data) value waveforms compared with the standard data permissible range. Clearly, when the monitored value waveform is outside of the permissible range, this waveform is a marking to an excess portion of the measured value waveform determined by the determinant. The CRT and the data processing structure of Morikawa would have obviously been similar to Appellants' process section 13 and display. Additionally, an alarm is a type of marking such as a warning lamp or buzzer which are known error indicators, see Appellants' specification page 14, lines 6-12. These waveforms with a portion of the line outside the upper and lower limit values are markings, but the portion is not a thicker line. The waveform outlying the limits is marking the excess portion of the measured value waveform.

(b) The Thicker Marking

These arguments are similar to those in Appellants' Section VII.A.1.(b) and are fully responded to above in Ground A.1.(b) The Thicker Marking.

(c) The Display

Appellants argue that the display waveforms of Morikawa does not display the measured value waveform having the excess portion to which the marking is applied. Morikawa clearly shows the displaying of the measured injection pressure waveform compared to the upper and lower limit values in Figures 2 and 3. If the results waveform is outside of the permissible range, then the display would show the excess

portion beyond the upper and lower limit values in Morikawa. The waveform line being thicker in the excess portion only relates to the appearance of the display and does not change the function of the injection molding machine or the monitoring of the pressure.

Ground B: Rejection over Morikawa '009

2. Method claim 7 and dependent claims 9-12 and 14

(a) Applying The Marking

Appellants argue that Morikawa does not teach applying a marking to an excess portion of the measure value waveform and that the Examiner has not explained why this would have been obvious. However, Morikawa in the abstract describes an alarm being issued which is clearly similar to the marking being a warning lamp or buzzer (Appellants' specification page 14, lines 11 and 12). Additionally, Morikawa clearly shows the displaying of the measured injection pressure waveform compared to the upper and lower limit values. These waveforms with a portion of the line outside the upper and lower limit values are markings. The waveform outlying the limit values is marking the excess portion of the measured value waveform.

(b) Applying a Thicker Marking

These arguments are similar to those in Appellants' Section VII.A.1.(b) and are fully responded to above in Ground A.1.(b) The Thicker Marking and Ground A.2.(b) Applying a Thicker Marking.

(c) Displaying the Excess Portion with the Marking

Appellants argue that the display waveforms of Morikawa does not display the measured value waveform having the excess portion to which the marking is applied.

Morikawa clearly shows the displaying of the measured waveform compared to the upper and lower limit values in Figures 2 and 3. If the results waveform is outside of the permissible range, then the display would show the excess portion beyond the upper and lower limit values in Morikawa. The waveform line being thicker in the excess portion only relates to the appearance of the display and does not change the function of the injection molding machine or the monitoring of the pressure.

Ground C: Rejection over Neko

1. Apparatus claim 1 and dependent claims 3, 5, 6 and 13

(a) The Marking Applier

Appellants argue that Neko's value ER is not a marking, but a counter variable in the memory, and is not displayed. Appellants' apparatus which is considered the marking applier is the process section 13 which calculates an excess portion of the measured value waveform that exceed the reference pressure. Neko's calculates the difference in the reference and actual pressures and updates a counter, value ER, which is a marking as to the excess portion of the measured value waveform that exceeds the reference pressure. The CRT displays the result of the article conformity discrimination (Neko col. 11, lines 52-54). The PMCCPU 114 which contains the information used for determining the article conformity waveforms would have been capable of sending the waveforms for display through the use of the CRT display unit and the indication of the marking of the error occurrences which have been determined in Neko.

(b) The Thicker Marking

These arguments are similar to those in Appellants' Section VII.A.1.(b) and are fully responded to above in Ground A.1.(b) The Thicker Marking.

(c) The Display

Appellants argue that Neko does not teach a display for displaying the measure value waveform having the excess portion to which the marking is applied. Neko discloses a CRT to display the results and Fig. 4 shows a graph of the reference pressure, the allowable range and a broken line showing the actual resin pressure. The display showing a marking applied to the excess portion of the measured value waveform would have been descriptive material wherein the information of the number of errors and the display of the waveform of Neko shows the descriptive material in a different arrangement.

Ground C: Rejection over Neko

2. Method claim 7 and dependent claims 9-12 and 14

(a) Applying The Marking

Appellants argue that Neko does not teach applying a marking to an excess portion of the measure value waveform and that the Examiner has not explained why this would have been obvious. However, Neko describes the determination of an error when the excess waveform portion occurs and counts number of occurrence of the excess portion or error and outputs a defective signal which is similar to the marking being a warning lamp or buzzer (Appellants' specification page 14, lines 11 and 12). Additionally, Neko shows the graph of the measured injection pressure waveform

compared to the upper and lower limit values. These waveforms with a portion of the line outside the upper and lower limit values are markings. The waveform outlying the limit values is a marking the excess portion of the measured value waveform.

(b) Applying a Thicker Marking

These arguments are similar to those in Appellants' Section VII.A.1.(b) and are fully responded to above in Ground A.1.(b) The Thicker Marking and Ground A.2.(b) Applying a Thicker Marking.

(c) Displaying the Excess Portion with the Marking

Appellants argue Neko does not display the measured value waveform having the excess portion to which the marking is applied. Fig. 4 of Neko shows a graph of the waveforms with the upper and lower limits. The measured values outside of these upper and lower limits is a marking of the excess portion. However, this marking is shown as a continuation of the measured waveform line. In addition the display would show a defective signal when the error counter limit has been reached.

Ground D: Rejection over Moriwaki '254 taken together with Neko

1. Apparatus claim 1 and dependent claims 3, 5, 6 and 13

(a) The Marking Applier

Appellants argue that the outlying observation in Moriwaki '254 is part of the waveform and would not have been considered a marking applied to the waveform since it is part of the waveform. However, in Moriwaki, the outlying observation has been determined, stored and is used to indicate an abnormality. The marking applier is performing the calculations for the determination of the waveform being outside of the

limit range so as to indicate an abnormality. The display would show the operator where the waveform is outlying the limit values and the process controller would use the calculated determination to control the operation of the injection molding machine.

Neko has been combined with Moriwaki '254 for teaching a hydraulically operated injector, a sorter and the stopping of the injecting operation when the measured pressure data waveform exceeds a reference pressure waveform maximum and minimum detected more than a predetermined number of times. Appellants are similarly counting the number of times an error signal is successively indicated in the calculation performed in the process section 13, see appellants' specification page 11, lines 2-10. These error signals are markings applied to the data within the processor wherein the data is a waveform since it will be used to display the waveform.

(b) The Thicker Marking

These arguments are similar to those in Appellants' Section VII.A.1.(b) and are fully responded to above in Ground A.1.(b) The Thicker Marking.

(c) The Display

Appellants argue that Moriwaki '254 does not teach the display for displaying the measured value waveform having the excess portion to which the marking is applied wherein the marking is a thicker marking. The display would show the operator where the waveform is outlying the limit values and the process controller would use the calculated determination to control the operation of the injection molding machine. . These waveforms with a portion of the line outside the upper and lower limit values are

markings, but the portion is not a thicker line. The waveform outlying the limit values is marking the excess portion of the measured value waveform.

Ground D: Rejection over Moriwaki '254 taken together with Neko

2. Method claim 7 and dependent claims 9-12 and 14

(a) Applying The Marking

These arguments are similar to those in Appellants' Section VII.D.1.(a) and are fully responded to above in Ground D.1.(a).

(b) Applying a Thicker Marking

These arguments are similar to those in Appellants' Section VII.A.1.(b) and are fully responded to above in Ground A.1.(b) The Thicker Marking and Ground A.2.(b) Applying a Thicker Marking.

(c) Displaying the Excess Portion with the Marking

Appellants argue that the display waveforms of Moriwaki '254 does not display the measured value waveform having the excess portion to which the marking is applied. Moriwaki clearly shows the displaying of the measured waveform compared to the upper and lower limit values in Figure 4. If the results waveform is outside of the permissible range, then the display would show the excess portion beyond the upper and lower limit values in Moriwaki. The waveform line being thicker in the excess portion only relates to the appearance of the display and does not change the function of the injection molding machine or the monitoring of the pressure.

Ground E: Rejection over Moriwaki '244 in view of Sekido, taken together with Inden in view of Colorblind

1. Apparatus claim 1 and dependent claims 3, 5, 6 and 13

(a) The Marking Applier and the Display

Appellants argue that neither Moriwaki '244 nor Sekido teach a marking applier applying a marking to an excess portion of the measured value waveform determined by the determinant and a display for displaying the measured value waveform having the excess portion to which the marking is applied. The examiner contends that in Moriwaki '244 the waveform generator and malfunction signal would have been considered a marking applier since the signal is determined from the calculated waveform and would have signaled a portion of the result waveform being in excess of the predetermined range of the reference pressure waveform. However, in Moriwaki '244, this marking is not taught as being a thicker portion of the waveform. Sekido (Figs. 1a, 1b, 1c) clearly shows the displaying of the measured injection pressure waveform compared to the upper and lower limit values. The showing of the result (measured) waveform in the display of Moriwaki '244 would have been obvious since this result waveform being inserted between the upper limit waveform and the lower limit waveform is determined by the processor of Moriwaki '244. The marking applier which applies a marking to an excess portion of the measured value waveform determined by the determinant would have included a device which marks the excess portion by drawing the line of the result (measured) waveform displayed with the upper and lower limit waveforms as is shown in Fig. 1a, 1b, 1c of Sekido. The line of this

result waveform line outside of the limit waveform is a marking. The waveform line being thicker in the excess portion only relates to the appearance of the display and does not change the function of the injection molding machine or the monitoring of the pressure.

Appellants argue that Inden does not teach a marking applier applying a marking to an excess portion of the measured value waveform determined by the determinant and a display for displaying the measured value waveform having the excess portion to which the marking is applied. Appellants' apparatus which is considered the marking applier is the process section 13 which calculates the waveform and deviation, and the display 14 converts the waveform measured values to the display, page 9, line 3 thru page 10, line 10 of the specification. Inden (col. 5, lines 31-43) teaches the "abnormal information adding section (56) detects whether the measured data is normal, that is, between the upper value and the lower value or is abnormal, that is outside the upper value or the lower value, and displays the occurrence of abnormal information to give an alarm when an abnormal condition has been detected. The abnormal information condition is displayed, as shown in FIG. 9, by displaying a red line at the left side when the measured data is abnormal. In this case, a variation in the method, such as changing a color of the line of the trend format or changing the line into a dotted line, may be considered." Clearly this detecting and displaying would require the marking applier to produce the red line marking of the abnormal condition which is displayed.

(b) The Thicker Marking

Appellants argue that neither changing the color of the line nor changing the line into a dotted line changes or alters the thickness of the line in any way. However, the changing of the line into a dotted line does change the thickness of the line by removing a portion of the line to form the dotted line.

Appellants argue that the use of Colorblind is impermissible hindsight reasoning. However, the adjusting of the shape and color of a graph lines would have been obvious to a person of ordinary skill in the art so as to provide the desired view and clarity. Clearly, Moriwaki '244, Sekido, Inden and Colorblind are related as to the displaying of graphs with multiple lines. Additionally, the use of different shape and size of lines would provide distinctness between the lines when using a black and white display screen.

Appellants argue that Colorblind would prompt one to make the entire line in Inden thicker in all areas. However, Inden (col. 5, lines 31-43) discloses that when an abnormal information condition (outside of the upper and lower value) is displayed the line can be changed in color or to a dotted line, rather than displaying a red line to the left of the abnormal condition. Appellants' refers to Inden teaching a change in color or dotted line on the left side. However, Inden, col. 5, lines 40-43, is a variation in the use of the red line at the left. Inden is changing the color of the trend format or changing the line into a dotted line. This is changing the trend format which is the line of data shown on the display.

Ground E: Rejection over Moriwaki '244 in view of Sekido, taken together with Inden in view of Colorblind

2. Method claim 7 and dependent claims 9-12 and 14

(a) Applying The Marking and Displaying the Marking

Appellants argue that neither Moriwaki '244 nor Sekido teach applying a marking to an excess portion of the measured value waveform determined by the determinant and a display for displaying the measured value waveform having the excess portion. The examiner contends that in Moriwaki '244 the waveform generator and malfunction signal would have been considered as applying a marking since the signal is determined from the calculated waveform and would have signaled a portion of the result waveform being in excess of the predetermined range of the reference pressure waveform. However, in Moriwaki '244, this marking is not taught as being a thicker portion of the waveform. Sekido (Figs. 1a, 1b, 1c) clearly shows the displaying of the measured injection pressure waveform compared to the upper and lower limit values. The showing of the result (measured) waveform in the display of Moriwaki '244 would have been obvious since this result waveform being inserted between the upper limit waveform and the lower limit waveform is determined by the processor of Moriwaki '244. The applying of a marking to an excess portion of the measured value waveform determined by the determinant would have included the excess portion being drawn with the line of the result (measured) waveform displayed with the upper and lower limit waveforms as is shown in Fig. 1a, 1b, 1c of Sekido. The line of this result waveform line outside of the limit waveform is a marking. The waveform line being thicker in the

excess portion only relates to the appearance of the display and does not change the function of the injection molding machine or the monitoring of the pressure.

Appellants argue that Inden does not teach applying a marking to an excess portion of the measured value waveform determined by the determinant and displaying the measured value waveform having the excess portion to which the marking is applied. Appellants' have not disclosed in the specification any new calculation or processing for determining and displaying the waveform and marking, page 9, line 3 thru page 10, line 10 of the specification. These methods of calculating and determining the waveform and displaying the waveform are within the skill of the art. The changing of the thickness of the waveform line so as to indicate an abnormality is taught by Inden and Colorblind as previously discussed above.

(b) Applying a Thicker Marking

Appellants argue that neither changing the color of the line nor changing the line into a dotted line changes or alters the thickness of the line in any way. However, the changing of the line into a dotted line does change the thickness of the line by removing a portion of the line to form the dotted line.

Appellants argue that Colorblind would prompt one to make the entire line in Inden thicker in all areas. However, Inden (col. 5, lines 31-43) discloses that when an abnormal information condition (outside of the upper and lower value) is displayed the line can be changed in color or to a dotted line, rather than displaying a red line to the left of the abnormal condition. Inden, col. 5, lines 40-43, teaches a variation in the use of the red line at the left. Inden is changing the color of the trend format or changing the

line into a dotted line. This is changing the trend format (waveform) which is the line of data shown on the display.

Ground F: Rejection over Morikawa '009 taken together with Inden in view of Colorblind

1. Apparatus claim 1 and dependent claims 3, 5, 6 and 13

(a) The Marking Applier and the Display

Appellants' arguments refer to those in Appellants' Section VII.B.1.(a) and (c) and are fully responded to above in Ground B.1.(a) and (c).

(b) The Thicker Marking

Appellants' arguments refer to those in Appellants' Section VII.E.1.(b) and are fully responded to above in Ground E.1.(b).

2. Method claim 7 and dependent claims 9-12 and 14

(a) Applying The Marking and Displaying the Marking

Appellants' arguments refer to those in Appellants' Section VII.B.1.(a) and (c) and are fully responded to above in Ground B.1.(a) and (c) and Ground B.2.(a) and (c).

(b) Applying a Thicker Marking

Appellants' arguments refer to those in Appellants' Section VII.E.1.(b) and are fully responded to above in Ground E.1.(b) and Ground E.2.(b).

Ground G: Rejection over Neko taken together with Inden in view of Colorblind

1. Apparatus claim 1 and dependent claims 3, 5, 6 and 13

(a) The Marking Applier and the Display

Appellants' arguments refer to those in Appellants' Section VII.C.1.(a) and (c) and are fully responded to above in Ground C.1.(a) and (c).

(b) The Thicker Marking

Appellants' arguments refer to those in Appellants' Section VII.E.1.(b) and are fully responded to above in Ground E.1.(b).

2. Method claim 7 and dependent claims 9-12 and 14

(a) Applying The Marking and Displaying the Marking

Appellants' arguments refer to those in Appellants' Section VII.C.1.(a) and (c) and are fully responded to above in Ground C.1.(a) and (c) and Ground C.2.(a) and (c).

(b) Applying a Thicker Marking

Appellants' arguments refer to those in Appellants' Section VII.E.1.(b) and are fully responded to above in Ground E.1.(b) and Ground E.2.(b).

Ground H: Rejection over Moriwaki '254 taken together with Neko in view of Inden and Colorblind

1. Apparatus claim 1 and dependent claims 3, 5, 6 and 13

(a) The Marking Applier and the Display

Appellants' arguments refer to those in Appellants' Section VII.D.1.(a) and (c) and are fully responded to above in Ground D.1.(a) and (c).

(b) The Thicker Marking

Appellants' arguments refer to those in Appellants' Section VII.E.1.(b) and are fully responded to above in Ground E.1.(b).

2. Method claim 7 and dependent claims 9-12 and 14

(a) Applying The Marking and Displaying the Marking

Appellants' arguments refer to those in Appellant's Section VII.D.1.(a) and (c) and are fully responded to above in Ground D.1.(a) and (c) and Ground D.2.(a) and (c).

(b) Applying a Thicker Marking

Appellant's arguments refer to those in Appellant's Section VII.E.1.(b) and are fully responded to above in Ground E.1.(b) and Ground E.2.(b).

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Jill L. Heitbrink/

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